

Radon变换与功率谱结合的PSA图像倾斜度自动校正算法

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基金项目：国家

摘要：

针对卟啉传感阵列(PSA)图像中卟啉点阵列可能发生倾斜的现象, 设计了一种自动校正算法。算法之初对图像进行滤波、对比度增强操作, 并求得图像的二值形态学边界, 利用此二值边界图像作为求取倾斜角度运算的输入, 减少了噪声的影响, 同时也降低了时间的花费; 而后利用radon变换与功率谱结合的方法来求取倾斜角度, 解决了单纯的radon变换易受空域噪声的影响, 使得校正的精度大大提高。利用该算法对卟啉传感阵列图像进行自动校正测试, 结果表明该算法能够获得很好的校正效果。

关键词：图像预处理; 倾斜校正; radon变换; 功率谱估计

Automatic Tilt Correcting Algorithm for PSA Images Based on Radon Transform and Power Spectrum

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Abstract:

An image tilt correcting algorithm for porphyrin sensor array (PSA) images is presented, in response to the phenomenon that PSA images may have a small tilt angle. The algorithm obtains the tilt angle of porphyrin sensor array images based on radon transform and power spectrum. Meanwhile, combining morphological methods, the processing of filtering and contrast enhancing for PSA images is carried out as the first step, then the binary boundaries of the images, which are used as the inputs of tilt correcting operations, are obtained using morphological method. The algorithm has solved the problem of result instability using the method of radon transform, made up for the high cost of computing using the method of power spectrum and improved the accuracy of correction. With the algorithm, a lot of tests have been done for the porphyrin sensor array images. The results showed that this algorithm could gain a good performance.

Keywords: Image Preprocessing; Tilt Correct; Radon Transform; Power Spectral

投稿时间：2011-03-25

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